Application No.: 09/701,226 **MAT-8026US**
Amendment dated: June 25, 2003
Reply to Office Action of: April 8, 2003

Remarks/Arguments:

Claims 1-5 are pending. Claims 1-5 stand rejected.

Rejections Under 35 U.S.C. § 103

At page 2, paragraph 3, the Office Action sets forth, "Claims 1-5 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 4,490,635 to Harrison et al. in view of U.S. Patent No. 4,578,606 to Welterlin." Applicant respectfully submits that this rejection is overcome by the amendment to the claims for the reasons set forth below.

Applicant's invention, as recited in claim 1, includes features which are neither disclosed nor suggested by Harrison et al. or Welterlin, namely:

> ... a rotor with a permanent magnet having P (P is an integer not less than two) magnet polarities...
>
> ... two extension lines, which extend toward a shaft center of said rotor along both ends of each magnetic polarity of said rotor, form an angle with respect to the shaft center of said rotor...
>
> ... a stator facing said rotor and having a plurality of coils...
>
> ... any one of the plurality of coils has winding-bundles including isosceles sides interlinking with a magnetic field generated by the magnetic polarities...
>
> ... two extension lines extending along centers of the winding-bundles of the isosceles sides of the coil cross each other at the shaft center of said rotor and form a vertex angle of 360/P degrees...
>
> ... the vertex angle formed by the two extension lines extending along centers of the winding bundles is equal to the angle formed by the two extension lines extending along both ends of the each magnetic polarity of said rotor. (Emphasis added)

These features are described and fully supported in Applicant's specification, for example, at page 7, lines 18-20, page 8, lines 2-8 and Figs. 1A-1C.

According to claim 1, the rotor has a permanent magnet having P magnetic

polarities where extension lines of each of the magnetic polarities form an angle with respect to the shaft center of the rotor, and any of the plurality of coils have wiring bundles with isosceles sides that interlink with a magnetic field generated by the polarities. The two extension lines of the isosceles sides of the coil extend along the center of the winding bundles and cross each other at the shaft center of the rotor to form a vertex angle of 360/P. In addition, the vertex angle formed by the two extension lines extending along centers of the winding bundles is equal to the angle formed by the two extension lines extending along both ends of each magnetic polarity of the rotor.

Harrison et al. is relied upon as teaching a brushless motor having a rotor having P polarities and a polarity angle, and a stator having a plurality of coils. The Office Action readily admits, however, that Harrison et al. fails to disclose i) a vertex angle of 360/P degrees, ii) the vertex angle being equal to the polarity angle, iii) that the angle formed by the extension lines of the isosceles sides is the same as the polarity angle, or iv) that the extension lines cross each other at the center of the motor shaft.

Welterlin is relied upon as disclosing a brushless motor where "any one of the coils has isosceles sides interlinking with magnetic field generated by the polarities extension lines of the isosceles sides extending through the centers of wiring-bundles of the coil, crossing each other at a shaft center having a vertex angle of 360/P degrees, the vertex being equal to the polarity angle." Office Action at page 3. To support this point the Office Action includes an excerpt of Fig. 2 from Welterlin in which extension lines are drawn.

First, applicant respectfully disagrees with this contention, especially as it relates to the extension lines purportedly extending through the centers of the wiring bundles of the coils in Welterlin. As clearly illustrated in the Office Action at page 3 (the copy of Fig. 2 of Welterlin), the extension lines do not extend along centers of the wiring bundles, but rather are at an angle relative to the center line of the wiring bundles.

Once again, Applicant respectfully directs the Examiner's attention to Exhibit A attached to applicant's response filed on August 26, 2002, which illustrates extension lines extending along the centers of Welterlin' wiring bundles. As is clearly

shown in Exhibit A, if lines are drawn along the centers of the wiring bundles they do not intersect at the shaft center.

Furthermore, Welterlin does not disclose or suggest that the vertex angle formed by the two extension lines extending along centers of the winding bundles is equal to the angle formed by the two extension lines extending along both ends of the each magnetic polarity of the rotor.

In contrast, Applicant's invention, as recited in claim 1, specifies that i) the two extension lines of each magnetic polarity of the rotor, form an angle with respect to the shaft center of the rotor, ii) the two extension lines extending along centers of the winding-bundles of the isosceles sides of the coil cross each other at the shaft center of the rotor and form a vertex angle of 360/P degrees, and iii) the vertex angle formed by the two extension lines extending along centers of the winding bundles is equal to the angle formed by the two extension lines extending along both ends of the each magnetic polarity of the rotor.

It is because Applicant has included the features of i) two extension lines of each magnetic polarity of the rotor forming an angle with respect to the shaft center of the rotor, ii) two extension lines extending along centers of the winding-bundles of the isosceles sides of the coil crossing each other at the shaft center of the rotor and form a vertex angle of 360/P degrees, and iii) the vertex angle formed by the two extension lines extending along centers of the winding bundles are equal to the angle formed by the two extension lines extending along both ends of the each magnetic polarity of the rotor, that Applicant is able to reduce the number of coils as well as increase the motor constant. Neither Harrison et al. nor Welterlin achieve this advantage because Harrison et al. and Welterlin do not have i) two extension lines of each magnetic polarity of the rotor forming an angle with respect to the shaft center of the rotor, ii) two extension lines extending along centers of the winding-bundles of the isosceles sides of the coil crossing each other at the shaft center of the rotor and form a vertex angle of 360/P degrees, and iii) the vertex angle formed by the two extension lines extending along centers of the winding bundles being equal to the angle formed by the two extension lines extending along both ends of the each magnetic polarity of the rotor.

For the reasons set forth above, claim 1 is neither disclosed nor suggested by

Application No.: 09/701,226 **MAT-8026US**
Amendment dated: June 25, 2003
Reply to Office Action of: April 8, 2003

Harrison et al. and Welterlin alone or in combination. Thus, claim 1 is not subject to rejection under 35 U.S.C. § 103 as being unpatentable over Harrison et al. in view of Welterlin. Reconsideration and allowance of claim 1 is therefore respectfully requested.

Claims 2-5 ultimately depend on claim 1 and, thus, are likewise not subject to rejection for at least the reason set fort with respect to claim 1. Reconsideration and allowance of claims 2-5 is respectfully requested.

Applicant has amended Fig. 1C to illustrate the extension lines extending toward the shaft center of the rotor. This amendment is fully supported in the specification and does not add new matter. Applicants respectfully requests therefore that the amendment to fig. 1C be entered.

In view of the amendments and remarks set forth above, the above-identified application is in condition for allowance, which action is respectfully requested.

Respectfully submitted,

Lawrence E. Ashery, Reg. No. 34,515
Jacques L. Etkowicz, Reg. No. 41,738
Attorneys for Applicant

JLE/fp

Attachment: Figure 1C

Dated: June 25, 2003

The Commissioner for Patents is hereby authorized to charge payment to Deposit Account No. **18-0350** of any fees associated with this communication.	I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on: **June 25, 2003**